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Next 31 Page(s) In Document Exempt

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PAGE 001

TOT: 272252Z NOV 78

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FOR YOUR INFORMATION FOLLOWING SUMMARY AND PREFACE FROM UNCLASSIFIED NFAC RESEARCH PAPER, "SOVIET CHEMICAL EQUIPMENT PURCHASES FROM THE WEST: IMPACT ON PRODUCTION AND FOREIGN TRADE," ER 78-10554, OCTOBER 1978. PUBLIC AFFAIRS OFFICE RELEASING TO PRESS.

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25X1A

1. SUMMARY--THE USSR IS HIGHLY DEPENDENT ON WESTERN CHEMICAL TECHNOLOGY. DURING PERIOD 1961-75, SOVIET ORDERS FOR WESTERN CHEMICAL EQUIPMENT AND RELATED PROCESS DATA AMOUNTED TO AT LEAST \$5 BILLION, MORE THAN 70 PERCENT COMING DURING THE NINTH FIVE-YEAR PLAN (1971-75). CONTRACTS SIGNED IN THE FIRST TWO YEARS OF THE 10TH FIVE-YEAR PLAN (1976-80) EXCEEDED \$3 BILLION, CONTINUING THE HEAVY EMPHASIS ON ORDERS FOR THE CHEMICAL INDUSTRY.

DESPITE THE LARGE INFUSIONS OF WESTERN EQUIPMENT AND TECHNOLOGY THE USSR REMAINS AN OVERALL NET IMPORTER OF CHEMICAL PRODUCTS, AND WITH FEW EXCEPTIONS, IT HAS NOT EVEN BECOME AN IMPORTANT EXPORTER OF SELECTED CHEMICALS. MOREOVER, THE CHEMICAL EQUIPMENT RECEIVED TO DATE FROM THE WEST DOES NOT APPEAR TO HAVE LED TO A GENERAL IMPROVEMENT IN SOVIET TECHNOLOGY FOR MANUFACTURING CHEMICAL EQUIPMENT. GAINS IN OVERALL EFFICIENCY AND PRODUCT QUALITY HAVE COME MORE SLOWLY AND PROBABLY AT GREATER COST THAN ANTICIPATED BY SOVIET PLANNERS.

NONETHELESS, WESTERN EQUIPMENT AND TECHNOLOGY ARE CONTRIBUTING SUBSTANTIALLY TO SOVIET OUTPUT OF SEVERAL MAJOR CHEMICAL PRODUCTS AND, IN CERTAIN CASES, ARE PROVIDING SIZABLE SAVINGS IN CONSTRUCTION AND PRODUCTION COSTS.

WESTERN-EQUIPPED CHEMICAL PLANTS ACCOUNTED FOR:

CONFIDENTIAL

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STAFF

78 1621226

PAGE 002  
TOT: 272252Z NOV 78

DIRECTOR 333302

--40 PERCENT OF MULTINUTRIENT (COMPLEX) FERTILIZERS PRODUCED IN 1975.

--60 PERCENT OF POLYETHYLENE PRODUCTION IN 1975.

--75 TO 85 PERCENT OF POLYESTER FIBERS IN 1975.

--72 PERCENT OF NEW AMMONIA PRODUCTION CAPACITY IN 1971-75 AND 85 PERCENT OF THAT SCHEDULED IN 1976-80. MOREOVER, BECAUSE MOST OF THE PURCHASED CAPACITY OF RECENT YEARS IS NOT YET IN PRODUCTION, MANY BENEFITS LIE AHEAD.

ECONOMIES IN CONSTRUCTION AND OPERATION OF CHEMICAL PLANTS STEM FROM SHORTER CONSTRUCTION PERIODS AND THE USE OF MORE ECONOMICAL PROCESSES. WESTERN-EQUIPPED PLANTS IN THE USSR GENERALLY ARE COMPLETED THREE TO FIVE YEARS AFTER ORDERS ARE PLACED, COMPARED WITH AN AVERAGE OF EIGHT YEARS FOR ALL SOVIET CHEMICAL PLANTS. BY INCORPORATING TECHNOLOGY DEVELOPED IN 1960S THAT REVOLUTIONIZED THE AMMONIA INDUSTRY IN THE WEST, WESTERN-SUPPLIED AMMONIA PLANTS HAVE SUBSTANTIALLY CUT SOVIET PRODUCTION COSTS. DURING 1971-75, AVERAGE UNIT PRODUCTION COSTS FOR SOVIET AMMONIA FELL BY 8.5 PERCENT AS A RESULT OF INTRODUCING THE NEW INSTALLATIONS. SUCH PLANTS USE ONLY ABOUT 5 PERCENT OF THE ELECTRIC POWER AND ONE-THIRD OR LESS OF THE WORKERS REQUIRED PER METRIC TON OF OUTPUT IN EXISTING SOVIET-DESIGNED PLANTS. COMPARED TO OLDER SOVIET PLANTS, SAVINGS OF UP TO 30 TO 40 PERCENT IN UNIT INVESTMENT COSTS ARE POSSIBLE.

SOVIET CONSTRUCTION AND OPERATION OF MANY IMPORTED CHEMICAL INSTALLATIONS STILL SUFFER FROM POOR PLANNING, INFERIOR MANAGEMENT, AND INADEQUATELY TRAINED OR INDIFFERENT WORKERS. THE LIKELY CONTINUATION OF THESE DEFICIENCIES WILL PREVENT THE USSR FROM REALIZING THE FULL POTENTIAL OF ITS HUGE PURCHASES OF WESTERN CHEMICAL TECHNOLOGY.

BECAUSE DOMESTIC REQUIREMENTS ARE GROWING RAPIDLY, FEW DRAMATIC EXAMPLES OF A TURNAROUND IN FOREIGN TRADE IN CHEMICALS HAVE RESULTED FROM EQUIPMENT PURCHASES. HOWEVER, SOVIET ORDERS OF CHEMICAL EQUIPMENT PLACED BETWEEN 1974 AND MID-1977, WHICH OFTEN WERE ASSOCIATED WITH LONG-TERM COMPENSATION (PRODUCT BUY-BACK) AGREEMENTS, WILL CONTRIBUTE TO A SHARP INCREASE IN SOVIET CHEMICAL EXPORTS IN 1980 AND BEYOND. SALES OF AMMONIA UNDER SUCH AGREEMENTS WILL BE AN

CONFIDENTIAL

CONFIDENTIAL

STAFF

78 1621226

PAGE 003  
TDT: 272252Z NOV 78

DIRECTOR 333302

IMPORTANT DESTABILIZING FACTOR IN WORLD AMMONIA MARKETS IN THE 1980S. APART FROM THEIR ROLE IN STIMULATING SOVIET CHEMICAL EXPORTS, THE COMPENSATION AGREEMENTS ALMOST CERTAINLY ARE PERMITTING THE CHEMICAL INDUSTRY TO DEVELOP AT A RATE THAT COULD NOT OTHERWISE BE SUSTAINED BY THE USSR.

2. PREFACE--FOR MORE THAN A DECADE THE SOVIET UNION, IN AN EFFORT TO BRING ITS LARGE BUT BACKWARD CHEMICAL INDUSTRY UP TO MODERN STANDARDS, HAS INVESTED HEAVILY IN PURCHASES OF WESTERN EQUIPMENT AND KNOW-HOW. THIS REPORT WILL EXAMINE THE PATTERN OF SOVIET PURCHASES OF CHEMICAL EQUIPMENT IN THE NINTH FIVE-YEAR PLAN (1971-75) AND PROVIDE SOME OBSERVATIONS ON THE CONTRIBUTION OF THESE AND EARLIER PURCHASES TO OUTPUT AND EFFICIENCY OF THE SOVIET CHEMICAL INDUSTRY. BECAUSE MANY OF THE PURCHASES MADE IN 1974 AND 1975 ARE NOT YET ON STREAM, JUDGMENTS CONCERNING THE NET BENEFITS OF ORDERS THROUGH 1975 MUST BE TENTATIVE. AN APPENDIX PROVIDES A LIST OF INDIVIDUAL CONTRACTS FOR PURCHASES OF CHEMICAL EQUIPMENT AND TECHNOLOGY FROM NON-COMMUNIST COUNTRIES DURING 1971-75.  
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